

# Space News Roundup

Vol. 34

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No. 33

## Shaw to leave shuttle operations, NASA

Holloway becomes new manager of shuttle program

Brewster Shaw, director of space shuttle operations, has announced he is stepping down from that post effective today, and will leave the agency on Nov. 3. Tommy Holloway, currently director of the Phase One Program has been named to take Shaw's place with a new title of manager, space shuttle program.

"This was an extremely difficult decision for me to make. The decision to leave as director of shuttle operations was for personal rea-

sons," Shaw said. "I feel it is best for me to leave the program now. I am heartened that Tommy Holloway has agreed to take over this position. I have the utmost respect for the personnel involved in the space shuttle program and am confident that the shuttle will continue to operate as successfully and as safely as it has since return to flight."

In his new role as manager, space shuttle program, Holloway will direct the day-to-day management and

execution of the shuttle program, including detailed program planning, scheduling and shuttle systems configuration management.

Shaw, a former astronaut, flew on three shuttle missions. He piloted *Columbia* during STS-9. This Spacelab-1 mission was the first six-man crew and the first international crew. During the 10 day flight, the crew conducted more than 70 multidisciplinary scientific and technical investigations.

Shaw commanded the STS-61B mission that deployed communications satellites and tested space station techniques during two six-hour space walks.

Shaw's last shuttle flight, STS-28, also was as commander of a Department of Defense mission.

Shaw left JSC in 1989 to become deputy director of space shuttle operations at Kennedy Space Center. He became director of shuttle operations in 1993.



**Brewster Shaw**

## Scientist lives 15 days on plant oxygen

By James Hartsfield

When portrayed in science fiction, the workings of future spacecraft are often the epitome of advances in electronics, materials and computers, but as a current JSC study demonstrated, humans may literally return to their roots for some parts of such future spacecraft and planetary bases.

For 15 days, Dr. Nigel Packham, a Lockheed-Martin life support systems scientist, lived on an atmosphere continually recycled by about 30,000 thriving wheat plants. The regenerative life support systems test was the first in a series of tests of advanced, recycling life support technologies planned over the next several years, said Dr. Don Henninger, chief scientist for regenerative life support systems.

"NASA has not performed human testing of these types of technologies for more than 25 years," Henninger said. "And regenerative life support is a critical enabling technology. Without it, a trip to Mars or bases on the Moon or Mars are simply impossible. You just cannot carry all of the supplies with you that are needed for such voyages without recycling many of the things life consumes."

In the Bldg. 7 laboratory, Packham was locked into a less than 100 square foot room that adjoins a 9 by 14 foot growth chamber. Air from Packham's room was recycled by the dwarf wheat plants, which removed carbon dioxide and created oxygen as they grew. The process worked well, and 30,000 thickly growing plants actually produced twice as much oxygen as needed, Henninger said.

Packham was chosen from among 15 volunteers to be the test subject. The small chamber, with a desk, bunk, computer, toilet, sink and exercise bike, was comfortable, he said as the test was under way.

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**Top:** Test subject Nigel Packham displays a handful of the 30,000 wheat plants that produced oxygen for him during the 15-day regenerative life support systems test in Bldg. 7. The plants actually produced twice as much oxygen as Packham needed during his 15-day stay in the Bldg. 7 test chamber. The test, completed Aug. 8, was the first of its kind at JSC in more than 25 years. **Bottom:** Among the console teams that monitored test activities in Bldg. 7 around the clock during the 15-day operation were, from left, Marybeth Edeen, Ed Mohr and John Lewis.



## Wetherbee new acting deputy director at JSC

JSC Acting Director George Abbey on Tuesday appointed veteran Astronaut Jim Wetherbee to be acting deputy director for JSC.

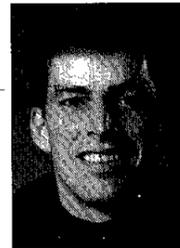
Wetherbee will share responsibility for managing the overall activities of the center, including administering the scientific and technical functions of JSC's programs.

Wetherbee brings to the assignment a thorough understanding of the space program and a diverse technical background that will assist in the day-to-day operations of the center, Abbey said.

The Navy commander began his career with NASA after having been selected for the astronaut program in May 1984. He is a veteran of three shuttle missions in 1990, 1992 and 1995 with more than 696 hours in space.

On his first mission Wetherbee was the pilot of STS-32 aboard *Columbia* in January 1990. Crew members successfully deployed the Syncom IV-F5 satellite, and retrieved the 21,400-pound Long Duration Exposure Facility using the shuttle's robot arm. In October 1992, Wetherbee commanded STS-52, a 10-day mission. His crew successfully deployed the Laser Geodynamic Satellite, a joint Italian-American project. They also operated the first U.S. Microgravity Payload with French and American experiments.

Early this year aboard *Discovery*, Wetherbee was the commander of STS-63, the first rendezvous with the Russian Mir Space Station and the first flight of the new joint Russian-American space program.



**Wetherbee**

## Endeavour repairs begin

Engineers from NASA and Thiokol, Inc. are poised to begin repair work on *Endeavour's* reusable solid rocket motor nozzle joint O-rings that could result in a launch for the shuttle around the end of the month or early September.

The removal and refill of the room temperature vulcanizing insulation material will begin the wake of a review by an independent team of engineers led by Jim Ehl, director of the Safety and Mission Assurance Office at Marshall Space Flight Center. The team

reviewed procedures and techniques that will be used to "excavate" and refill the RTV around the primary and secondary O-rings on both nozzle joints No. 3 and No. 4.

The STS-69 launch was delayed on July 28 after NASA managers received briefings on heat impingement detected on the primary O-ring on booster nozzle joints from the *Atlantis* launch on June 27 and from *Discovery's* launch on July 13.

The decision to add nozzle joint No. 4 was made after engineers

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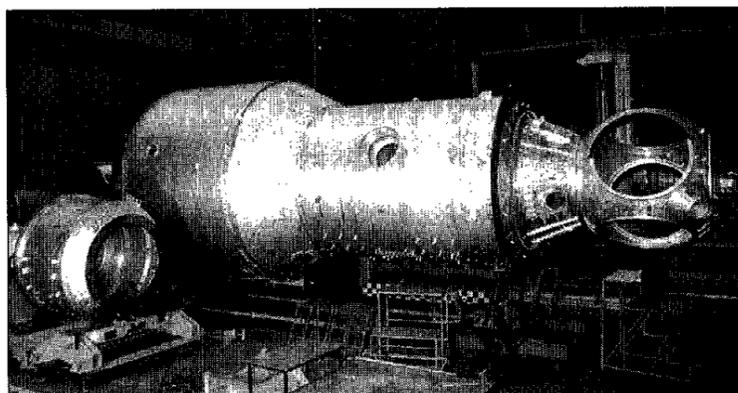
## Boeing, Russia sign agreement

By Linda Copley

Final agreement was reached Tuesday on a \$190 million contract for Russia to provide the first flight element of the International Space Station.

The agreement signed by NASA's Space Station prime contractor, Boeing Defense and Space Group, and Russia's State Research and Production Space Center (Khrunichev) will lead to completion, delivery, launch and on-orbit checkout in

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**The Functional Energy Block, a modified Russian space vehicle, will serve as the first building block for the on-orbit construction of the International Space Station.**

## Financial management encourages direct deposit

By Deborah Conder

In the interest of reducing administrative costs, the Department of Treasury will soon require all federal employees to receive salary payments by electronic fund transfer, more commonly known as "direct deposit."

While this requirement is not yet in place, JSC's Financial Management Division this week began encouraging employees to plan ahead and arrange for direct deposit as the primary method for receiving salary

payments. In signing up now, employees can avoid the last-minute rush once the requirement is effective.

"The expense of disbursing government money electronically through direct deposit is significantly less than producing checks. In the current era of streamlining and cost-cutting initiatives across the federal government we are forced to look at less costly alternatives," said JSC Financial Management Officer John

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JSC

# Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Store from 10 a.m.-2 p.m. Monday-Thursday and 9 a.m.-3 p.m. Friday. For more information, call x35350 or x30990.

**Cowboys vs. Oilers:** Aug. 26, San Antonio. Tickets cost \$60, available on 20, 30-yard-line and end zone. Tickets include transportation.

**Schlitterbahn:** Tickets cost \$17.80 for adults and \$15.30 for children 3-11.

**Sea World:** Tickets cost \$23.50 for adults and \$16.25 for children 3-11.

**Six Flags:** Tickets cost \$23.70 for a one day pass, \$31.75 for two day pass and \$20.30 supersaver not valid on weekends in June July and August.

**Astroworld:** Tickets cost \$18.10.

**Waterworld:** Tickets cost \$9.25.

**Splashtown:** Tickets cost \$11.05.

**Fiesta Texas:** Tickets cost \$20.35 for adults and \$15.80 for children 4-11 and seniors over 55.

**Moody Gardens:** Discount tickets for two of three different attractions: \$9.50.

**Space Center Houston:** Discount tickets, adult, \$8.75; child (3-11), \$7.10.

**Metro tickets:** Passes, books and single tickets available.

**Movie discounts:** General Cinema, \$4.75; AMC Theater, \$4; Sony Loew's Theater, \$4.75.

**Stamps:** Book of 20, \$6.40.

**JSC history:** *Suddenly, Tomorrow Came: A History of the Johnson Space Center.* Cost is \$11.

**Upcoming Events:** Caribbean Getaway Oct. 13-16, final payment due Aug. 25.

JSC

# Gilruth Center News

**Sign up policy:** All classes and athletic activities are first come, first served. Sign up in person at the Gilruth Center and show a NASA badge or yellow EAA dependent badge. Classes tend to fill up two weeks in advance. Payment must be made in full, in exact change or by check, at the time of registration. No registration will be taken by telephone. For more information, call x30304.

**EAA badges:** Dependents and spouses may apply for photo identification badges from 7 a.m.-9 p.m. Monday-Friday; and 8 a.m.-4 p.m. Saturdays. Dependents must be between 16 and 23 years old.

**Basketball:** registration will be held the week of Aug. 14-18.

**Volleyball:** registration will be held the week of Aug. 14-18.

**Weight safety:** Required course for employees wishing to use the weight room is offered from 8-9:30 p.m. Aug. 24 and Sept. 12. Pre-registration is required. Cost is \$5.

**Exercise:** Low-impact class meets from 5:15-6:15 p.m. Mondays and Wednesdays.

**Aerobics:** High/low impact class meets from 5:15-6:15 p.m. Tuesdays and Thursdays. Cost is \$32.

**Aikido:** Martial arts class meets from 5-7 p.m. Tuesdays and Wednesdays. Cost is \$25 per month. New classes begin the first of each month.

**Ballroom dancing:** Cost is \$60 per couple. For additional information call the Gilruth Center at x33345.

**Fitness program:** Health Related Fitness Program includes a medical examination screening and a 12-week individually prescribed exercise program. For more information, call Larry Wier at x30301.

JSC

# Swap Shop

Swap Shop ads are accepted from current and retired NASA civil service employees and on-site contractor employees. Each ad must be submitted on a separate full sized, revised JSC Form 1452. Deadline is 5 p.m. every Friday, two weeks before the desired date of publication. Ads may be run only once. Send ads to Roundup Swap Shop, Code AP2, or deliver them to the deposit box outside Rm. 181 in Bldg 2. No phone or fax ads accepted.

## Property

Lease: Barringer Way condo, 2-1, W/D conn, pool, ex cond, storage area, no pets, \$495/mo. 486-2048.

Sale: College Station townhome, 2-1, .9 mi from campus, \$35.k or trade for waterfront condo.

Sale: Clear Lake Forest, 4-2-5-2, glass walled den w/hi ceiling, FPL, formals, family room, new roof/paint/carpet/paper. 333-5300 or 326-2307.

Rent: El Dorado Trace condo, 2-2, balcony, FPL, W/D, alarm, \$550/unfurn, \$650/furn, obo. 333-8126 or 488-1327.

Sale/Rent: Baywind 1 condo, 1-1-1, appl, CF, priv, balcony, \$380/mo + dep or \$22k. Bill, 471-3999.

Sale/Lease: University Trace condo, 1 BDR, study, W/D, downstairs, \$510/mo. x48621 or 480-2417.

Sale: Heritage Park, Friendswood, 3-2-2, new A/C, New roof, \$65k assumable. x38074 or 480-8099.

Rent: Alvin, house, 3-2-2, formal dining, fence, convenient location. 331-3334.

Sale: Bay Glen, 4-2-2, 1 story, 2164 sq ft, many upgrades, \$111.9k. x36185 or 409-765-5877.

Sale: Lake Livingston waterfront property, 2 - 65 acres, can divide, fair market price. 409-377-4245.

Sale: League City, 3-2-1, open plan, lg living & kitchen, 10' ceiling, garden master bath, \$96,750. 554-5464.

Sale: Lot, League City, \$6.5k. 333-5493.

Sale: Highland Village, townhome, 2-2-5-2A, neutral interior, w/blackened hardware in kit, plantation shutters, wood decked atrium, appl. 498-7343.

Rent: Seabrook/Miramar, 4-2-2, avail 9/1, \$825/mo. Liz, x32292 or 331-3950.

Rent: Beach house, Crystal Beach, Galveston county, all amenities, 4-2, sleeps 12, lg deck, 486-1888 or 409-684-4419.

Rent: Arkansas cottage on Blue Mt Lake, huge stone FPL, screened porch, \$250/wkly \$50/dly. Corcoran, x33005 or 334-7531.

Rent: Galveston condo, furn, sleeps 6, Seawall Blvd & 61st St, wknd/wkly/dly rates. Magdi Yassa, 333-4760 or 486-0788.

## Cars & Trucks

'74 VW thing, white, new engine/battery, good tires, \$3k obo. Dick, 335-6842 or 286-4444.

'91 CRX, red, 5 spd, clean, Kyle, 996-1264.

'85 Olds Calais, 5 spd, 4 cyl, A/C, \$1,250. 991-0821.

'78 Honda CR125, many new parts, runs great, \$700 or trade for 4 stroke dirt bike or similar size. x35192 or 332-0746.

'74 Triumph Spitfire, new paint & interior, removable hard top, spare engine & transmission, \$1.4k

obo. Craig, 280-0176.

'87 Ford Bronco II, Eddie Bauer, ex cond, new parts, \$4.6k. 532-1807.

'87 Chevy Cavalier, 64k mi, auto, cassette, A/C needs work, \$2k obo. Mike, x31915 or 388-0770.

'87 Mercury Cougar, ex cond, garaged, loaded, 62k mi, AM/FM/cass, \$4.9k. 488-0658.

'69 Chevy C10 stepside pickup, runs good, \$750. Mike, 286-4205.

'84 Pontiac Fiero, new rebuilt engine, new transmission/tires, needs wiring harness, \$1.5k as is. John, x30052 or 486-7428.

'83 V-12 Jaguar, 2 dr, XJS, original, 53k mi, claret, \$9.5k. 333-2395.

'90 Coupe deVille, white, 2 dr, RWD, A/C, pwr, 80 model, nice. 333-2395.

'92 GMC Safari XT/SLE van, black, dual A/C, 4 spd, auto, AM/FM/cass/CD, fully loaded, \$12.5k. x37246 or 676-0705.

'87 Ford Crown Victoria, ex cond, 67.5k mi, fully loaded, 1 owner, \$3.5k. 488-6798.

'88 Dodge Aries 5 pass station wagon, TBI 2.2L, 5 spd, PS/PB/cruise, A/C, 78k mi, new A/C evap/clutch, \$2.9k. Lane, x30786 or 280-0437.

'76 Chevy Impala, 350, V8, auto, white w/blue interior, runs good, \$800. 482-2157.

## Cycles

'92 Yamaha 4 wheeler, shaft drive, for 12yrs or older, \$1.3k firm. x39138 or 474-5260.

## Boats & Planes

Sailboat, 22' fiberglass, 5 hp O/B, 2 jib sails, potty, \$3.5k or trade for pwr boat, or house boat on trailer. x37441 or 339-2834.

'87 Beneteau sailing sloop, 23.5', equipped for racing, 2 jibs, spinnakers, 9.9 hp Johnson O/B, VHF radio, electronic depthfinder, auto tiller, Loran, safety equip, sleeps 4, head, sink, alcohol stove, \$14.5k. Ken, x31496.

Century 6 meter ski boat, 260 hp Merc I/O, digital depth finder, AM/FM/cass, EO stereo, '95 Shorlander galv trailer, \$10k. Jim, x30166 or 286-7374.

## Audiovisual & Computers

Pioneer, 160 watts, \$160; Magnepan M61 electrostatic speakers, \$350 obo. x32567 or 488-3314.

Gemini Star 10X printer, dot matrix, \$60. Diane, x30055 or 334-4474.

Citizen printer "CSX-140" w/GSX color option, \$199. Magdi Yassa, 333-4760 or 486-0788.

Peavy guitar amplifier, 60 watts, reverb, distortion, footswitch, effects loop, 12" speaker. \$295. Victor, 282-4625 or 481-9335.

AT&T 6300 PC, 2 complete systems, color monitors, 1 dot matrix printer, software, \$250/both. Ron, x30881 or 480-6771.

Microsoft Visual C++, CD ROM, V 1.5, \$75; Paradox for Windows, \$80; C++ book w/CD ROM examples, \$40; Space Quest V, \$20; printer board, \$15. 282-3570 or 474-3820.

Kenwood 7000, AM/FM stereo w/in dash CD, detachable face, sec light, \$75. 335-1451

## Today

**Cafeteria menu** — Special: baked chicken. Total Health: roast beef au jus. Entrees: deviled crab, baked chicken, beef cannelloni, steamed pollock, Reuben sandwich. Soup: seafood gumbo. Vegetables: seasoned carrots, peas, breaded okra, steamed cauliflower.

## Monday

**Cafeteria menu** — Special: hamburger steak. Total Health: vegetable lasagna. Entrees: beef Burgundy over noodles, barbecue smoked link, vegetable lasagna, steamed fish, French dip sandwich. Soup: chicken and wild rice. Vegetables: buttered corn, steamed spinach, vegetable sticks, navy beans.

## Tuesday

**Photo club meets:** The Bay Area Photo Club will meet at 7:30 p.m. Aug. 22 at the Faith Covenant Church. For more information call Kelly Prendergast at x37655.

**BAPCO meets:** The Bay Area PC Organization will meet at 7:30 p.m. Aug. 22 at League City Bank. For more information call Guy Thibodeaux at 333-5340.

**Cafeteria menu** — Special: turkey and dressing. Total Health: roast turkey. Entrees: barbecue spare ribs, liver and onions, baked chicken, steamed fish French dip sandwich. Soup: black bean and rice. Vegetables: steamed broccoli, California vegetables, breaded squash, savory dressing.

## Wednesday

**Toastmasters meet:** The Space-land Toastmasters will meet at 7 a.m. Aug. 23 at House of Prayer Lutheran Church on Bay Area Blvd. For additional information, contact Elaine Trainor, x31034.

**Astronomy seminar:** The JSC Astronomy Seminar will meet at noon Aug. 23 in Bldg. 31, Rm. 129. A video will be shown with R.

Dennicutt discussing "HST Extragalactic Distance Scale." For more information, call Al Jackson at 333-7679.

**NMA meet:** The National Management Association will meet at 5 p.m. Aug. 23 at the Gilruth. For more information call Kathy Kaminiski at x38706.

**Cycle club:** The Space City Cycle Club will meet for a 25-mile ride beginning at 6 p.m. Aug. 23 at the University of Houston Clear Lake soccer field. For more information on this ride and weekend rides call Mike Prendergast at x45164.

**Cafeteria menu** — Special: Mexican dinner. Total Health: ground turkey tacos. Entrees: beef cannelloni, turkey tacos, steamed fish, Reuben sandwich. Soup: seafood gumbo. Vegetables: peas and carrots, ranch beans, mustard greens, Spanish rice.

## Thursday

**NASACOM meets:** The NASA Commodore's User's Group will meet at 7:30 p.m. Aug. 24 at the Clear Lake Park Bldg. For more information call Glenda Souliere at x31764.

**Cafeteria menu** — Special: smothered steak. Total Health: steamed pollock. Entrees: chicken and dumplings, corned beef and cabbage, broccoli cheese quiche, steamed fish, French dip sandwich. Soup: navy bean soup. Vegetables: steamed cabbage, cauliflower au gratin, buttered carrots, lima beans.

## Friday

**Cafeteria menu** — Special: baked meatloaf. Total Health: baked potato. Entrees: chicken fajitas, ham steak, pork and beef eggrolls, steamed fish, Reuben sandwich. Soup: seafood gumbo. Vegetables: stewed tomatoes, seasoned spinach, cut corn, macaroni and cheese.

## Aug. 30

**Toastmasters meet:** The Space-

land Toastmasters will meet at 7 a.m. Aug. 30 at House of Prayer Lutheran Church on Bay Area Blvd. For additional information, contact Elaine Trainor, x31034.

**Blood drive:** Rockwell will host its annual blood drive from 8-11:30 a.m. and 1-2:30 p.m. Aug. 30 at 600 Gemini. For information call Margy Pelonero at 282-3418.

**Astronomy seminar:** The JSC Astronomy Seminar will meet at noon Aug. 30 in Bldg. 31, Rm. 129. An open discussion meeting is planned. For more information, call Al Jackson at 333-7679.

**Cycle club:** The Space City Cycle Club will meet for a 25-mile ride beginning at 6 p.m. Aug. 30 at the University of Houston Clear Lake soccer field. For more information on this ride and weekend rides call Mike Prendergast at x45164.

## Aug. 31

**Blood drive:** JSC will host its annual blood drive from 7:30-11:30 a.m. and 1-3:30 p.m. Aug. 31 at the Gilruth Center. For information call Marty Demaret at x36007.

**Radio club meets:** The JSC Amateur Radio Club will meet at noon Aug. 31 in Bldg. 16 Rm. 253. For more information call Larry Dietrich at x39198.

## Sept. 4

**Labor Day:** Most JSC offices will be closed in observance of the Labor Day holiday.

## Sept. 5

**ABWA meet:** The Clear Lake Area Chapter of the American Business Women's Association will meet at 5:30 p.m. Sept. 5 at Space Center Houston's Silver Moon Cafe. For more information call Nancy Hutchins at x34006.

## Sept. 12

**Photo club meets:** The Bay Area Photo Club will meet at 7:30 p.m. Sept. 12 at the Faith Covenant Church. For more information call Kelly Prendergast at x37655.

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Rent: Galveston condo, furn, sleeps 6, Seawall Blvd & 61st St, wknd/wkly/dly rates. Magdi Yassa, 333-4760 or 486-0788.

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'74 VW thing, white, new engine/battery, good tires, \$3k obo. Dick, 335-6842 or 286-4444.

'91 CRX, red, 5 spd, clean, Kyle, 996-1264.

'85 Olds Calais, 5 spd, 4 cyl, A/C, \$1,250. 991-0821.

'78 Honda CR125, many new parts, runs great, \$700 or trade for 4 stroke dirt bike or similar size. x35192 or 332-0746.

'74 Triumph Spitfire, new paint & interior, removable hard top, spare engine & transmission, \$1.4k

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'87 Mercury Cougar, ex cond, garaged, loaded, 62k mi, AM/FM/cass, \$4.9k. 488-0658.

'69 Chevy C10 stepside pickup, runs good, \$750. Mike, 286-4205.

'84 Pontiac Fiero, new rebuilt engine, new transmission/tires, needs wiring harness, \$1.5k as is. John, x30052 or 486-7428.

'83 V-12 Jaguar, 2 dr, XJS, original, 53k mi, claret, \$9.5k. 333-2395.

'90 Coupe deVille, white, 2 dr, RWD, A/C, pwr, 80 model, nice. 333-2395.

'92 GMC Safari XT/SLE van, black, dual A/C, 4 spd, auto, AM/FM/cass/CD, fully loaded, \$12.5k. x37246 or 676-0705.

'87 Ford Crown Victoria, ex cond, 67.5k mi, fully loaded, 1 owner, \$3.5k. 488-6798.

'88 Dodge Aries 5 pass station wagon, TBI 2.2L, 5 spd, PS/PB/cruise, A/C, 78k mi, new A/C evap/clutch, \$2.9k. Lane, x30786 or 280-0437.

'76 Chevy Impala, 350, V8, auto, white w/blue interior, runs good, \$800. 482-2157.

Phone Mate 8400 telephone answering machine, \$45. Faye, 470-1455.

Mac Pro Plus extended Macintosh keyboard, \$100; Sy Quest 44 Mb SCSI drive, \$150; 9 - 44 Mb cartridges, \$25 ea. 480-3424.

Apple personal laserwriter 300 printer, \$400; Apple Imagewriter II color printer, \$85; Apple Stylewriter 1200 Inkjet printer, \$225; Grolier's Encyclopedia CD-ROM for Mac, \$15; Time Almanac CD, \$10; Family Doctor CD, \$10; 30 Atlas CD, \$10. x42444 or 488-4382.

Round Christmas antique pine dining table, 48" dia, 2 capt & 2 side chairs, \$250. Don C. Brown, x38241 or 488-0754.

Kenmore hvy duty washing machine, white good cond, \$130 obo. 470-9775.

Sectional 10 pcs sofa, blue, \$150 obo. Jerry, x38173 or 480-8220.

King size bed, natural wood, mattress, ex cond, \$275. Katy Hurlbert, x34546 or 280-0951.

G.E



# Workplace Welcome

## JSC opens doors to thank neighbors for long-term support

By Steve Nesbitt

Sharing the excitement of the workplace and building a bond with the community will be the focus of the JSC Open House planned for Aug. 26.

In a scene that will be reminiscent of earlier years when the center was open for self-guided tours, thousands of visitors are expected during a six-hour event that will showcase the best JSC has to offer as area communities are invited through the gates.

What may seem like part of the everyday routine to NASA and contractor workers who spend their days in the business of human space flight is still exciting and inspirational for most Americans, even those in the Houston area who have become accustomed to hearing the city's name spoken regularly from spacecraft orbiting the Earth. The open house offers a special insider's view to the science and technology that make possible regular space shuttle missions and are today laying the foundations for future flights and programs.

Even when JSC's gates were open every day, visitors did not tour laboratories and engineering shops as they will during open house. JSC Director Dr. Carolyn L. Huntoon conceived the idea for an open house as a way of saying thanks to the Houston area communities for the long-standing support they have provided.

As they make the tour, visitors will see a coordinated set of technology demonstrations and facility walk-throughs planned to showcase JSC's role as a center of excellence for human space flight and to remind them of the contributions that the space program makes to their quality of life and economic well-being.

Visitors will get the chance to hear astronauts describe their space flights and see where they train. Engineers and scientists will be on hand to demonstrate many of the special tools and projects on which they work.

Also on display will be space suits, moon rocks, a Martian meteorite and the 100-foot vacuum chamber once used to test the Apollo spacecraft. Astronauts in flight suits will be available in the Bldg. 3 and 11 cafeterias to sign autographs.

Educational activities designed for children will be offered in Teague Auditorium. Students will

be shown how to assemble a space shuttle paper glider, color space-related art, make rockets from plastic containers and use the Internet to get information about NASA.

Space art will be on display in the Bldg. 30S lobby and at other locations featuring both computer-generated and traditional media space art.

In a series of special presentations in the auditorium, current and former astronauts will describe space flights and astronauts and flight directors from earlier mission will offer a history lesson on America's human space flight program. Astronauts Story Musgrave and Norm Thagard will talk about their recent spaceflight experiences. Participants in the Apollo 13

mission will describe the real-life version of that historic mission.

The Open House comes during the annual Ballunar Festival sponsored by Space Center Houston, from August 25-27. This year's Ballunar Festival will feature more than 60 inflatable balloons along with other attractions. The festival will take place at Rocket Park with activities beginning at 6 p.m. next Friday.

All JSC gates will be open except for the main NASA Road 1 entrance which will be used only for Park and

Ride buses and logistics traffic supporting the Rocket Park events. Visitors attending both events will be allowed to park in the center's approximately 10,000 available spaces on Saturday. Trams normally used in the Space Center Houston tour will operate around the perimeter of the site allowing visitors to ride to various stops. As they enter the gates, visitors will be given a brochure that will include a map of JSC with all open buildings and tram stops marked.

Visitors to the Ballunar Festival may park in the Space Center Houston parking lot and walk or ride a tram to Rocket Park, use the Park and Ride bus service from the Clear Lake Park and Ride and Baybrook Mall area or drive into JSC and park on site. Admission is free to the JSC Open House and the Ballunar Festival.

Employees are reminded that large numbers of people will be walking through buildings and that offices and equipment should be secured at the end of the day Friday. Even though tour routes through facilities will be clearly marked and staffed, inevitably some visitors will wander off designated paths. □



NASA Photos

Top to bottom, left to right: Several balloons lift off from Rocket Park as part of the Lunar Rendezvous Festival activities last year. More than 60 balloons have requested entry to this year's Ballunar liftoff. A full scale traveling mock-up of the International Space Station will be part of the activities visitors can experience during the open house. The traveling station features hands-on exhibits that show how astronauts will conduct experiments in space. Visitors will be encouraged to try out a sleep restraint unit while aboard the station. Visitors can try out a wardroom table to see how astronauts will work and live in space. The hands-on exhibit travels in two 48-foot trailers, connected in an "L" shape. Inside the trailer depicting the living quarters, visitors see where the station's six international crew members will sleep, exercise, relax and prepare their meals. They are able to step into the astronaut's shower and bathroom compartments, peer into storage drawers or look out the porthole at the Earth.



### If You Want to Volunteer

Volunteers are needed to hand out fliers at the gates, provide directions and information to visitors and for other assignments. If you would like to help, please call the External Affairs Branch at x34241 and leave your name, organization mail code and phone, along with the time you're available to work.

## Three receive new roles in Engineering

Leonard Nicholson, director of the Engineering Directorate recently name three individuals to new post within the organization.

James Jaax has taken on the role of acting deputy director. Jaax will be responsible for providing engineering, development and test support to the space shuttle and space station programs. He will also provide long-range technical planning to ensure that progress for these programs reflects current experiences.

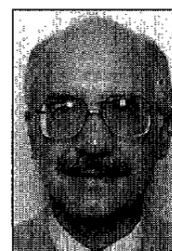
Over the past 26 years, Jaax has served in a variety of positions in the Crew and Thermal Systems Division. His managerial experience includes two years as thermal

systems branch chief, two years as manager of space station for the division and four years as deputy division chief. For the past year, Jaax has served as chief of the Engineering Business Management Office.

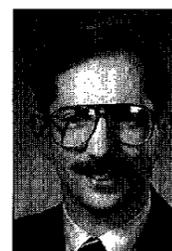
John Muratore has taken the responsibility of associate director for Engineering. In this capacity, he will be responsible for managing engineering development and test support for human space systems development programs. Most recently, Muratore was the chief of the Control Center Systems Division for the Mission Operations Directorate and was responsible for the development of the new mission control center. Previously, he served as division chief for the Reconfiguration

Management Division in MOD. In this role, he was responsible for the space shuttle flight software builds and maintenance and upgrades of the software production facility. He has also served as a flight director for four flights and as a flight controller for over 17 missions.

Stephen Oswald has been assigned the job of assistant to the director in Engineering. He will serve as liaison between the Engineering Directorate at JSC and various Department of Defense and national technology organizations. Specifically, Oswald will explore areas where Engineering divisions may establish



Jaax



Muratore



Oswald

relationships with DOD.

Oswald has extensive experience with the DOD, serving continuously on active and reserve status in the U.S. Navy since June of 1969. Oswald has been an astronaut since 1986, serving as a pilot on both STS-42 and STS-56 and commander of STS-67.

## Spaceflight Meteorology Group receives award

The Spaceflight Meteorology Group at JSC recently earned the National Weather Service's 1995 "Modernization Award" for Technology Implementation.

The annual award was given to the group in recognition of its creative set-up and utilization of the Next Generation Radar and Weather Surveillance Radar - 1988 Doppler.

"You are being recognized for exceptionally skilled and dedicated efforts in the NWS modernization," said Elbert Friday, assistant administrator for Weather Services. "Your commitment to the modernization has not only demonstrated a vision for the future but has supported that vision with dedication and hard work in the finest tradition of the NWS."

The Spaceflight Meteorology Group is the only operational NWS office to have "dedicated" lines to two WSR-88D sites. SMG routinely monitors WSR-88D Doppler radar data from a site in Melbourne, Fla., and from the site in League City. The group created a unique set of "user functions" for radar display. This allows meteorologists to utilize data from both sites simultaneously.

"Having direct lines to both sites increasing the efficiency of providing weather support for missions and for local use," said Frank Brody, chief of the Spaceflight Meteorology Group.

SMG's extensive use of WSR-88D data provides NASA flight directors with precise and timely information to aid in launch and landing decisions.

Additionally, the award cites SMG's work in detection of "chaff" radar returns over the Gulf of Mexico and Florida. Chaff is metal particles that appear on radar and can mask aircraft or weather returns. SMG worked closely with the military to coordinate exclusion periods prior to shuttle launches and landings.

## Direct deposit has many uses

(Continued from Page 1)

Beall. "Direct deposit of salary payments also provides for efficient, effective and timely transfer of funds to employees along with maintaining quality service."

Electronic fund transfers increase security, reliability and convenience for salary payments. There is no waiting in long bank lines or worrying about lost, stolen or delayed checks. If an employee is sick or on vacation, their paycheck goes into their account automatically.

To apply for direct deposit, employees must fill out a standard form 1199A and take it to the financial institution of their choice. After the bank completes the form, it is given to the JSC Payroll Office. The JSC Federal Credit Union fills out the form on-the-spot and gives employees the option to have the form mailed or hand-carried to the JSC Payroll Office. A separate form is needed for each type of allotment. Direct deposit usually takes less than 30 days to become effective.

Forms can be obtained at the Employee Services Office in Bldg. 45 Rm. 140, in the Payroll Office in Bldg. T-585 Rm. 117 or through a forms coordinator. For more information on direct deposit call x34834.



The team conducting the Early Human Testing Initiative Phase I Regenerative Life Support Systems test pose during the test last week. Team members include, front row, from left: Harry Halford, Mike Clark and Dean Duvall and back row, from left, Jeff Dominick, Don Overton, Nigel Packham, John Lewis, Ed Mohr, Daryl Ethington, Marybeth Edeen, Tim Monk and Dan Barta.

## Life test just beginning

(Continued from Page 1)

"It has been wonderful to gain the experience of the life support hardware by being on the receiving end of it," Packham said. "It was quite a struggle to get to this position. But this type of thing is something I've always wanted to do. Life has been pleasant here. It's home away from home once you get used to a small volume."

The air inside the chamber remained fresh throughout his two-week stay, which ended Aug. 8. The plants produced about five pounds of oxygen daily, enough that excess oxygen had to be pumped out. The use of biological systems for life support appears promising, Packham said.

"It has been very successful so far—a testament to the people who have worked long and hard to put this together," he explained. "The test has been not just to see if plants can keep a person alive. We are looking more at the effects the person has on the plants and that the plants have on the person."

Each day, Packham exercised on the stationary bicycle. During those periods, the lighting in the chamber can be brightened to encourage greater photosynthesis. During sleep, the growth chamber lights are dimmed and the plants produce less oxygen.

"The plants adapt very quickly to my metabolic state. When I work out on the bike for awhile and exhale a lot more carbon dioxide, they react very quickly to that," he explained. "It is almost as though they know I'm in here."

Packham's laboratory home was monitored around the clock by test directors from the Crew and Thermal Systems Division, led by Test Manager Jeff Dominick. All of the console operators volunteered for the duty, and Dominick said the effort was almost too much fun to be considered work.

"This has been the best and most fun project I've worked on in 13 years," he said. "A small core team has been working to set up this test for two years. When you work on a project that long, this is really the icing on the cake."

The test was followed with interest by many of Crew and Thermal

Systems Division's employees, as well as personnel from other areas that contributed to the effort.

The current study focused only on atmospheric regeneration using plants, and a study next year will look at recycling both air and water through mechanical and chemical means. The optimum regenerative system will likely consist of a combination of mechanical and biological systems, Henninger explained. The Phase II study, scheduled to begin in summer 1996, will have four persons living in a larger chamber for 15 days.

The removal of carbon dioxide and replenishment of oxygen for the Phase II study will use physiochemical equipment that scrubs carbon dioxide from the air, combines it with hydrogen to create water and then splits the water into its basic components. Water recycling will be done for all wastewater, Henninger said.

A third phase of the study, to take place in spring 1997, will have four persons living in a chamber for three months, with a combination of both biological and physiochemical equipment recycling the air and water. Plants will be used as part of the air regeneration and microbes will assist with recycling of water. Following Phase III, long-range plans are to develop a multi-chamber facility that can allow one-year, four-person studies, where not only air and water are recycled, but resources are recovered from solid waste and food is produced within the facility as well.

"We have a lot to learn and we're just scratching the surface with the Phase I test," Henninger explained. "When all of these studies are completed, we will know better where to focus research efforts to more efficiently gain the technology for regenerative life support in flight," he added.

As Packham left the chamber Tuesday morning, headed for a series of medical examinations. Although the stay within the chamber was not unpleasant, he was looking forward to open spaces.

"I think, this afternoon, I may go park by the lake somewhere and sit there awhile just to soak it in," he said.

## Scientists discuss living in biosphere

An intimate look at life in the self-contained environment of Biosphere 2 is the topic of a special lecture sponsored by the Space Medicine Fellowship Program.

Biospherians Taber MacCallum and Jayne Poynter will discuss "The Isolated Confined Environment of Biosphere 2" during the lecture session which begins at 5 p.m. Thursday at the Gilruth Center.

MacCallum and Poynter spent two years living in the three-acre closed-environment Biosphere dome located in the Arizona desert. During their time as researchers in the Biosphere, MacCallum and Poynter worked with their colleagues to maintain a balanced environment that included rainforest, savannah and desert as well as an intensive agricultural and horticultural system.

"The studies conducted during Biosphere 2 focused on understanding ecological, environmental and human issues associated with life in a closed environment," said Pat McGinnis, NASA flight surgeon. "Some of the issues addressed in these studies are the same questions we need to consider when we think about living in space for

extended periods of time."

MacCallum and Poynter will share their first-hand experiences in a lecture that is designed to present the medical and engineering communities and the general public with an understanding of the unique considerations involved when humans spend an extended time in an isolated environment.

JSC employees, contractors and the public are invited to attend the lecture. Unbadged foreign nationals may not attend the briefing. Cars without NASA decals should enter through the main gate near the intersection of NASA Road 1 and Saturn Lane.

The Space Medicine Fellowship is designed to train physicians in the unique aspects of space physiology research and operational space medicine.

The program is a joint effort between the University of Texas Medical Branch at Galveston and JSC and is coordinated by the Universities Space Research Association Division of the Space & Life Sciences Directorate.

For information, contact Kay Nute of USRA at 244-2019.

## First station block in construction

(Continued from Page 1)

November 1997 of the Functional Energy Block—or FGB—a modified Russian space vehicle that will serve as the first building block for the on-orbit construction of the International Space Station.

Space Station Program Manager Randy Brinkley noted that work is well under way on the FGB. "The Russians, like ourselves, are building hardware," he said. "Just as we're on schedule and have completed over 48,000 pounds of flight quality hardware on the U.S. side, the Russians also are on schedule for a November 1997 launch of the FGB."

After initial use as a power and propulsion module, the FGB will serve as a fuel and equipment storage facility. The FGB also forms a link in the station's overall power and information distribution systems.

In February, NASA and the Russian Space Agency signed a government-level protocol complementing the contractual agreement with Khrunichev for the U.S. purchase of the FGB. The protocol calls for RSA to launch the FGB on a

Russian Proton booster and to provide navigational control in orbit as well as providing related engineering, integration, logistics, maintenance and training support for the FGB.

A critical design review of the FGB was completed in April, and manufacturing and test of key structural components is in progress.

Assembly of the station in orbit will progress rapidly following launch of the FGB in 1997. One month later, a shuttle will carry to orbit the first U.S.-built element, an interlinking module called Node 1, that will be joined to the FGB and will provide docking ports and utility hookups for subsequent U.S. and international laboratory and habitation modules. Initial assembly and installation of a three-person international scientific crew will be accomplished by 1999. Science and research will progress in parallel with final assembly, and at completion in 2002, the station will have a six-person crew operating from seven laboratory and research modules representing the combined efforts of the U.S., Europe, Russia, Japan and Canada.

## New launch date may be set soon

(Continued from Page 1)

determined that more time and more risk would be associated with an X-ray analysis of the No. 4 joint and its thermal sealant in the current launch configuration. The extra work should not affect the repair schedule.

Working in tight quarters in the nozzle itself, equipped with breathing apparatus and tethers to prevent tools from falling and surrounded by scaffolding, a technician will carve

out the RTV in the crevice leading to nozzle joint No. 3. After the RTV is removed, another technician will use a "gun" to squirt new RTV under vacuum conditions to prevent air pockets from forming. The air pockets are believed to have allowed hot gasses through the RTV on the last two launches leading to the O-ring.

It will take about 15 days from the start of repair work until *Endeavour* is ready for launch.

## Child care center has opening

The JSC Child Care Center has an opening in the pre-K class.

This class is designed for children who would be attending kindergarten

in the fall of 1996. The class follows hand-on child centered curriculum.

For additional information call x34734.